Table 14: **Vpr**

HXB2 Location	Author Location	Sequence	Immunogen	Species(HLA)	References
Vpr(12–20)	Vpr(12–20 SF2)	REPHNEWTL	HIV-1 infection	human(B*4002)	[Altfeld (2001a)]
	• CTL responses against HIV-1 Vpr, Vpu, and Vif were analyzed in multiple HIV-1-infected individuals • Individuals with long-term nonprogressive and treated chronic HIV-1 infection targeted Vpr more frequently than individuals with treated acute infection • Only one B*4002+ individual was tested, and had a CTL response against REPHNEWTL • Vpr is a frequent target of HIV-1 specific CD8+ T-cells – a response was detected in 45% of individuals tested and Vpr and p17 were the most preferentially targeted proteins per unit length by CD8+ T-cells				
Vpr(30–38)	Vpr(29–38 SF2)	AVRHFPRIW	HIV-1 infection	human(B*5701)	[Altfeld (2001a)]
	• CTL responses against HIV-1 Vpr, Vpu, and Vif were analyzed in multiple HIV-1-infected individuals • This epitope was recognized by 4/6 individuals carrying the B*5701 allele • Individuals with long-term nonprogressive and treated chronic HIV-1 infection targeted Vpr more frequently than individuals with treated acute infection • Vpr is a frequent target of HIV-1 specific CD8+ T-cells – a response was detected in 45% of individuals tested and Vpr and p17 were the most preferentially targeted proteins per unit length by CD8+ T-cells				
Vpr(34–42)	Vpr(34–42 SF2)	FPRIWLHGL	HIV-1 infection	human(B*0702, B*8101)	[Altfeld (2001a)]
	• Epitope name: FL9. CTL responses against HIV-1 Vpr, Vpu, and Vif were analyzed in multiple HIV-1-infected individuals • This epitope was recognized by 2/2 individuals carrying the B*8101 allele and 4/8 individuals carrying the B*0702 allele • Individuals with long-term nonprogressive and treated chronic HIV-1 infection targeted Vpr more frequently than individuals with treated acute infection • Vpr is a frequent target of HIV-1 specific CD8+ T-cells – a response was detected in 45% of individuals tested and Vpr and p17 were the most preferentially targeted proteins per unit length by CD8+ T-cells • HIV+ individual AC-06 was tested for reactive overlapping peptides spanning all HIV-1 proteins in an ELISPOT and was found to react with 12 peptides from 7 proteins, suggesting that the breadth of CTL responses is underestimated if accessory proteins are not included in the study • FPRIWLHGL was the only epitope identified in Vpr for AC-06				
Vpr(59–67)	Vpr(58–66 LAI)	AIIRILQQL		human(A*0201)	[Altfeld (2001b), Brander & Goulder(2001)]
	• C. Brander notes this is an A*0201 epitope				
Vpr(59–67)	Vpr(58–66 SF2)	AIIRILQQL	HIV-1 infection	human(A*0201)	[Altfeld (2001a)]
	• Epitope name: AL9. CTL responses against HIV-1 Vpr, Vpu, and Vif were analyzed in multiple HIV-1-infected individuals • This epitope was recognized by 8/24 individuals expressing A*0201 allele				

- Epitope is located within a highly conserved α-helix in Vpr
- Individuals with long-term nonprogressive and treated chronic HIV-1 infection targeted Vpr more frequently than individuals with treated acute infection
- Vpr is a frequent target of HIV-1 specific CD8+ T-cells – a response was detected in 45% of individuals tested and Vpr and p17 were the most preferentially targeted proteins per unit length by CD8+ T-cells
- The A2 epitopes Vpr AIIRLLQQL and p17 SLYNTVATL do not account for the dominance of Vpr and p17, the result holds even when HLA-A2+ individuals are excluded

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Vpr(59–67) Vpr( ) AIIRILQQL HIV-1 infection human(A*0201) [Altfeld (2001d)]

- Epitope name: Vpr-59. HIV was scanned for all peptides which carried the A2-supermotif pattern conserved in more than 50% of B clade sequences – 233 peptides met this criteria, and 30 of these bound to HLA-A*0201 – 20/30 bound to at least 3/5 of HLA-A2 supertype alleles tested
- Three additional previously described HLA-A2 epitopes were added to the set of 20, and 18/22 chronically infected HLA-A2 individuals had CTL that recognized at least one of the 23 peptides (median of 2 and maximum of 6), while 6/12 acutely infected individuals recognized at least 1 (median of 1 and maximum of 2)
- AIIRILQQL binds to four HLA-A2 supertype alleles: A*0203, A*0201, A*0206 and A*6802 (highest affinity), but not A*0202
- 5/22 individuals with chronic HIV-1 infection recognized this epitope, but with low magnitude responses in ELISPOT
- 2/12 HLA-A2 patients with acute HIV-1 infection responded strongly to this peptide, but during chronic infection SL9 and Gag-386 tended to be immunodominant while Vpr-59 was weak and sub-dominant
- One of the the acutely infected individuals, AC13, was HLA A*0201/68 B44/14 and also had a strong acute response to gp41 epitope SV10 SLLNATDIAV
- This peptide was shown to be properly processed and presented in TAP-competent B-cell lines *in vitro*

Vpr(59–67) Vpr( ) AIIRILQQL HIV-1 infection human(A2) [Goulder (2001b)]

- Epitope name: AL9. Data from patient AC13 suggest a role for this epitope in initial control of viremia in acute infection, as it is one of several subdominant CTL epitopes recognized during the initial decline in viremia
- A CTL response to SL9, SLYNTVATL, was not evident until 18 months post-presentation

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Vpr(59–67) Vpr(59–67 SF2) AIIRILQQL HIV-1 infection human(A2) [Altfeld (2001c)]

- Therapy provided during acute infection resulted in a narrower CTL response, stronger T help response, and a less diverse viral population than was seen in individuals treated during chronic infection
- The breadth and specificity of the response was determined using ELISPOT by studying 19 individuals with pre-seroconversion therapy (Group 1), 11 individuals with primary infection but post-seroconversion therapy (Group 2), and 10 individuals who responded to HAART given during chronic infection (Group 3), using 259 overlapping peptides spanning p17, p24, RT, gp41, gp120 and Nef
- Previously described and newly-defined optimal epitopes were tested for CTL response
- Number of HLA-A2+ individuals that had a CTL response to this epitope broken down by group: 1/10 group 1, 0/6 group 2, and 0/4 group 3

Vpr(59–67) Vpr(59–67) AIIRILQQL HIV-1 infection human(A2 supertype) [Propato (2001)]

- Long-term non-progressors (LTNPs) had strong memory resting CD8+ T-cell responses against the majority of epitopes tested (18 for the A2 supertype, 16 for the A3 supertype) while the effector cells of long-term non-progressors recognized far fewer epitopes

- Progressors had memory resting CD8+ T-cells that recognized far fewer epitopes than LTNPs
- A positive correlation between effector CD8+ T-cells and plasma viremia and a negative correlation between CD8+ effector T-cells and CD4+ T-cells was observed, which may contribute to the inability of LTNPs to clear virus
- This epitope can bind four of the five HLA-A2 supertypes alleles (A*0201, A*020 2, A*0203, A*0206 and A*6802)

Vpr(62–70) Vpr( ) RILQQLLFI HIV-1 infection human(A*0201) [Altfeld (2001d)]

- Epitope name: Vpr-62. HIV was scanned for all peptides which carried the A2-supermotif pattern conserved in more than 50% of B clade sequences – 233 peptides met this criteria, and 30 of these bound to HLA-A*0201 – 20/30 bound to at least 3/5 of HLA-A2 supertype alleles tested
- Three additional previously described HLA-A2 epitopes were added to the set of 20, and 18/22 chronically infected HLA-A2 individuals had CTL that recognized at least one of the 23 peptides (median of 2 and maximum of 6), while 6/12 acutely infected individuals recognized at least 1 (median of 1 and maximum of 2)
- This epitope binds to three HLA-A2 supertype alleles: A*0202, A*6802 (strongest affinity) and A*0203
- 3/22 chronically infected patients had a weak ELISPOT response to this epitope
- 0/12 HLA-A2 patients with acute HIV-1 infection responded to this peptide

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Vpr(62–70) Vpr(62–70) RILQQLLFI HIV-1 infection human(A2 supertype) [Propato (2001)]

- Long-term non-progressors (LTNPs) had strong memory resting CD8+ T-cell responses against the majority of epitopes tested (18 for the A2 supertype, 16 for the A3 supertype) while the effector cells of long-term non-progressors recognized far fewer epitopes
- Progressors had memory resting CD8+ T-cells that recognized far fewer epitopes than LTNPs
- A positive correlation between effector CD8+ T-cells and plasma viremia and a negative correlation between CD8+ effector T-cells and CD4+ T-cells was observed, which may contribute to the inability of LTNPs to clear virus
- This epitope can bind three of the five HLA-A2 supertypes alleles (A*0201, A*020 2, A*0203, A*0206 and A*6802)
